



MINISTRY HEALTH CARE  
Ministry Saint Michael's Hospital Laboratory

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## LABORATORY POLICY AND PROCEDURE

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<b>TITLE/SUBJECT:</b>	<b>Venipuncture</b>
<b>FILE NUMBER:</b>	<b>PH001.05</b>
<b>ASSIGNED MANUAL:</b>	<b>Phlebotomy/Specimen Procurement</b>
<b>ORIGINATION DATE:</b>	<b>6-6-2007</b>
<b>EFFECTIVE DATE:</b>	<b>June 26, 2014</b>
<b>DISTRIBUTION:</b>	<b>All Saint Michaels Hospital Laboratories</b>

### PRINCIPLE/PURPOSE:

To obtain proper blood specimens for Laboratory analysis in the area of Hematology, Chemistry, Coagulation, and Bacteriology for the purpose of aiding in the diagnosis and treatment of illnesses and disorders, monitoring progress and following results of treatment.

### PATIENT PREPARATION:

Some tests may require that the patient fast 8 to 10 hours. Other tests may need to be drawn at a specific time, such as post-dose drug levels or timed glucose testing. See corresponding in-house procedure or reference manual specimen requirements for specific sample requirements

### SPECIMEN/HANDLING:

As determined by tests ordered. Serum, plasma, or whole blood may be required. Refer to SMH blood collection requirements - evacuated tube collection information and specific department/test collection procedures, and recommended order of draw.

### MATERIALS:

No expired supplies are used. Latex free supplies are used whenever possible. Protective safety devices are not removed from equipment.

Equipment	Reagents	Supplies
<ul style="list-style-type: none"><li>Evacuated tubes and bottles</li><li>Sterile needles/holders</li><li>Syringes</li><li>Transfer devices</li><li>Winged infusion sets</li></ul>		<ul style="list-style-type: none"><li>Alcohol wipes</li><li>Non-alcohol wipes (if medical alcohol is ordered)</li><li>Bandages/Tape</li><li>Disposable gloves</li><li>Gauze</li><li>Personal Protective equipment</li><li>Tourniquet</li></ul>

**STANDARDS:**

Saint Michael's Hospital hand washing and safety policies are monitored for use.

**CALIBRATION:**

NA

**QUALITY CONTROL:**

NA

**PROCEDURE:**

- 1.0 Greet patient and explain procedure to be performed.
  - 1.1 Initiate the Five Fundamentals of Service.
  - 1.2 Reassure the patient. The phlebotomist must gain the patient's confidence and assure the patient that, although the venipuncture will be slightly painful, it will be of short duration.
  - 1.3 Never tell a patient, "This won't hurt."
- 2.0 Check identification band, and the patient labels. Refer to the patient identification policy.
  - 2.1 Identification of the patient is crucial to insuring that the blood specimen is being drawn from the individual designated on the registration form.
- 3.0 Verify patient fasting or non-fasting status and therapeutic drug dosage time, if applicable.
  - 3.1 Document information on tube label.
- 4.0 Review paperwork and select appropriate tubes
  - 4.1 If paperwork or labels are not available at the time of the collection, label all tubes following guidelines of identification policy.
- 5.0 Position the patient comfortably
  - 5.1 Seated
  - 5.2 Lying down
  - 5.3 Never standing
  - 5.4 Arm supported and extended straight from shoulder to wrist
- 6.0 Wash and glove hands.
  - 6.1 Use non-latex gloves.
  - 6.2 Clean pair of gloves for each patient.
- 7.0 Assemble supplies:
  - 7.1 Evacuated Tubes
  - 7.2 Tourniquet

- 7.3 Alcohol wipes (or non-alcohol wipe if medical alcohol ordered)
- 7.4 Gauze
- 7.5 The appropriate type and size of needle and system to be used is based on the patient's physical characteristics and the amount of blood to be drawn.
- 7.6 Bandage/tape
- 8.0 Apply tourniquet and select Venipuncture site.
  - 8.1 Apply at least 3 inches from puncture site.
  - 8.2 Apply no longer than 1 minute, longer may result in erroneous results.
  - 8.3 Release and reapply after two minutes if additional time is needed.
  - 8.4 Apply over clothing to prevent pinching or irritating skin.
  - 8.5 Disconnect or remove auto blood pressure cuff if placed on arm being used for venipuncture.
- 9.0 Suitable site selection
  - 9.1 Veins of the antecubital fossa suitable for venipuncture:
    - 9.1.1 Median cubital vein – MCV
    - 9.1.2 Cephalic vein – CV
    - 9.1.3 Basilic vein – BV
  - (see subsequent pictures)
- 9.2 The larger and fuller median cubital, cephalic, and basilica veins are used most frequently, wrist and hand veins are also acceptable for venipuncture.
- 9.3 Sites to avoid:
  - 9.3.1 Burned or scarred areas
  - 9.3.2 Mastectomy patients – avoid side of body of mastectomy surgery.
  - 9.3.3 Double mastectomy-avoid arm with lymphedema.
  - 9.3.4 IV sites:
    - 9.3.4.1 Use opposite arm, when possible.
    - 9.3.4.2 If necessary, draw below IV line site. Ask nursing staff to turn off IV two minutes before drawing.
  - 9.3.5 Arteries:
    - 9.3.5.1 Arteries pulsate, are more elastic and have a thick wall
  - 9.3.6 Thrombosed veins:
    - 9.3.6.1 Thrombosed veins lack resilience, feel cord-like, and roll easily.
- 10.0 Palpate
  - 10.1 Trace vein path several times
  - 10.2 Vein will feel elastic/ resilient
- 11.0 Prepare Equipment
  - 11.1 Evacuated system
    - 11.1.2 Securely thread needle/butterfly into adaptor

- 11.2      Needle /syringe
  - 11.2.1     Sterile needle /butterfly
  - 11.2.2     Select appropriate size needle / syringe combination.
  - 11.2.3     Move plunger to ensure freedom of movement and syringe / needle patency.
- 12.0      Order of Draw
  - 12.1      Blood Cultures – mix 3-5 times
  - 12.3      Citrate Tube – invert 3-4 times
  - 12.4      SST gel separator tube, plain red top – invert 5 times
  - 12.5      Heparin Tube, PST gel separator tube – invert 8 to 10 times
  - 12.6      EDTA Tube – invert 8 to 10 times
  - 12.7      Oxalate /Fluoride Tube - invert 8-10 times
  - 12.8      Any other additive tubes—see manufacturer instructions
- 13.0      Cleanse venipuncture site
  - 13.1      Cleanse with alcohol
    - 13.1.1     Cleanse with a non-alcohol wipe if a medical alcohol level is ordered.
  - 13.2      Allow site to thoroughly dry to prevent hemolysis.
  - 13.3      Re-cleanse if site is re-palpated .
- 14.0      Uncap needle
  - 14.1      Inspect the tip of the needle for burrs / obstructions.
- 15.0      Anchor Vein
  - 15.1      Grasp the arm firmly, using your thumb to draw the skin taut.
  - 15.2      Make sure the venipuncture site is in a downward position to prevent reflux.
- 16.0      Perform the Venipuncture
  - 16.1      Evacuated System
    - 16.1.1     With the bevel up, line up needle with the vein at about a 15 degree angle to the skin.
    - 16.1.2     Use a clean smooth motion.
    - 16.1.3     Grasp the flange of the needle holder and push the tube forward until the needle punctures the stopper.
    - 16.1.4     Using correct order of draw (refer to Procedure Notes), fill tubes until vacuum is exhausted and blood flow stops.
    - 16.1.5     Remove tube.
    - 16.1.6     Mix immediately after drawing any tube containing an additive, and any plastic tube, by gently inverting 5-10 times.
    - 16.1.7     Insert next tube and repeat procedure.

- 16.1.8 Remove last tube.
- 16.1.9 Release the tourniquet.
- 16.1.10 Cover the needle with gauze.
- 16.1.11 Remove the needle.
- 16.1.12 Apply pressure to the site.
- 16.1.13 Engage needle safety device.
- 16.1.14 Dispose in biohazardous waste container.

16.2 Syringe and Needle System

- 16.2.1 With the bevel up, line up needle with the vein at about a 15 degree angle to the skin.
- 16.2.2 Use a clean smooth motion.
- 16.2.3 Withdraw the desired amount of blood by pulling back on the plunger while maintaining equal pressure with the hand holding the syringe barrel.
- 16.2.4 Change syringes if additional volume is needed.
- 16.2.5 Release the tourniquet.
- 16.2.6 Remove the needle.
- 16.2.7 Apply pressure.
- 16.2.8 Engage needle safety device.

- 16.2.8.1 Use transfer device to fill evacuated tubes.
- 16.2.8.2 Dispose in biohazardous waste container.

17.0 Label the Specimen

- 17.1 Refer to patient labeling policy.

18.0 Bandage patient's arm

- 18.1 Check to insure blood flow has stopped. Be alert to excess bleeding lasting longer than 5 minutes. Notify nursing staff and continue pressure.
  - 18.1.1 Use appropriate bandage.
  - 18.1.2 Advise patient to keep bandage on for 15 minutes.
  - 18.1.3 Pediatric patients – advise caregiver regarding choking hazards.

19.0 Deliver specimens to Laboratory for Processing

- 19.1 Place labeled tubes in a biohazard bag with the labels and send to the Laboratory via the pneumatic tube system, or take directly to the laboratory.
- 19.2 All temperature specific samples must be taken directly to the lab.

## 20.0 Adverse reactions to phlebotomy procedure

- 20.1 Syncope (fainting): Release the tourniquet and withdraw the needle. Dispose of the needle properly. Keep gauze on the puncture site, or bandage right away.
  - 20.1.1 If the patient is sitting, lower their head and arms.
  - 20.1.2 Loosen tight clothing.
  - 20.1.3 Instruct the patient to take slow, deep breaths.
  - 20.1.4 If possible, escort the patient to a reclining chair, and place a pillow under legs to help return blood flow to the head.
  - 20.1.5 .
  - 20.1.6 Offer sips of cold water or juice.
  - 20.1.7 Have an emesis basin or bag available. If patient has lost consciousness, dial 911 and state:  
“First Responder Alert”. Then give the location.
  - 20.1.8 Do not allow a patient to leave the area before they feel better.
  - 20.1.9 In-patients: Notify nursing personnel.

## 20.2 Nausea / Vomiting

- 20.2.1 Make the patient as comfortable as possible.
- 20.2.2 Instruct the patient to take slow deep breaths.
- 20.2.3 Give the patient an emesis basin or bag, and have tissues available.
- 20.2.4 Apply cold compresses to the patient’s forehead (if they desire).
- 20.2.5 Offer the patient water to rinse out his/her mouth.

## 20.3 Convulsions

- 20.3.1 Prevent the patient from injuring him/herself. DO NOT restrain the movements of the patient’s extremities completely, but try to prevent injury.
- 20.3.2 Dial 911 and state:  
“First Responder Alert” then give the location.

## 20.4 Patient Refusal

- 20.4.1 Do not argue with the patient.
- 20.4.2 Try to reassure the patient.
- 20.4.3 Talk in a calm, direct manner.
- 20.4.4 Emphasize that the doctor ordered the tests.
- 20.4.5 Notify the patient’s nurse of all refusals.

20.5 Locating a Vein

- 20.5.1 Massage the arm if not readily apparent.
- 20.5.2 Tap vein site.
- 20.5.3 Apply heat pack.
- 20.5.4 Lower the extremity.

20.6 Unable to obtain a specimen

- 20.6.1 Carefully re-position the needle.
- 20.6.2 Do Not probe.
- 20.6.3 Try another tube.
- 20.6.4 Loosen the tourniquet.
- 20.6.5 DO NOT attempt a venipuncture more than twice.

20.7 Hematoma prevention

- 20.7.1 Puncture only the upper most wall of the vein.
- 20.7.2 Remove the tourniquet before needle.
- 20.7.3 Apply pressure when bandaging.
- 20.7.4 If a hematoma occurs, suggest that the patient apply ice to reduce swelling.
- 20.7.5 Increased pain and redness should be followed up by a physician.

20.8 Hemolysis Prevention

- 20.8.1 Mix specimens gently but thoroughly – invert 5-10 times.
- 20.8.2 Avoid drawing from a hematoma.
- 20.8.3 Avoid extreme pressure on the syringe plunger.
- 20.8.4 Avoid using small gauge needles.
- 20.8.5 Avoid frothing.
- 20.8.6 Thoroughly allow alcohol to dry before proceeding
- 20.8.7 Slow “start and stop” draws may cause hemolysis.
- 20.8.8 Repeat collection with smaller needle, if needed.

**DERIVATION OF RESULTS:**

Refer to specific Laboratory Procedure

**REPORTING:**

Refer to specific Laboratory Procedure

**NORMAL VALUES:**

Refer to specific Laboratory Procedure

**CRITERIA FOR IMMEDIATE NOTIFICATION:**

Refer to specific Laboratory Procedure

**INTERPRETATION:**

Refer to specific Laboratory Procedure

**CRITERIA FOR UNACCEPTABLE RESULTS AND CORRECTIVE ACTION:**

- 1.0 Unlabeled or incorrectly labeled tubes require repeat collection
- 2.0 Hemolyzed specimens if test is affected by hemolysis, require repeat collection
- 3.0 Improperly processed or clotted specimens from anticoagulated tubes require repeat collection.

**LIMITATIONS:**

**PROCEDURE NOTES:**

- 1.0 Phlebotomists specially trained in line draws are the only ones who may use ports and indwelling catheters to obtain blood samples.
- 2.0 Samples will be drawn from lower extremities after checking with the patient's nurse or provider.
- 3.0 If a citrate tube is the only tube to be drawn, a discard tube is no longer required. When using a "butterfly" collection kit, a discard tube is necessary due to the "dead space" within the tubing, which will result in inadequate sample volume.
- 4.0 In the event that it is absolutely necessary to draw blood from a site above or below an IV line, the nurse should turn off the IV for at least 2 minutes. After the 2- minute wait, the tourniquet may be applied. Draw the sample. Inform the nursing staff when you have completed the draw, to restart the IV
- 5.0 Ensure that there is the correct ratio of anticoagulant to blood. Citrate tubes must be full. EDTA tubes must be filled to at least one third of the fill volume, but do not overfill.

**6.0 TPN Draws**

- 6.1 If at all possible (to save the patient a needle stick) blood should be drawn off the indwelling line that the TPN is being infused. The following is the process as outlined in The Nursing Service Manual (NS-550)

*Any labs except blood cultures.*

- a) Stop IV infusions. When drawing from a central line with TPN running through a lumen, turn off the TPN for 15 minutes prior to the lab draw.
- b) Attach 10-mL syringe to lumen and discard waste according to chart below. To assist with blood return, may flush with 10 –mL saline prior to waste.
- c) Draw amount of blood needed for test as indicated by laboratory personnel.
- d) Flush with prefilled saline syringe as needed to clear tubing of all blood using a pulsing method to create a turbulence that results in an effective clearance of blood from the line.
- e) Resume IV infusions.

*Flush and Waste Chart for central lines:*

a)

<b>Adults</b>	<b>Maintenance IV</b>	<b>TPN &amp; lipids</b>	<b>Coag Studies</b>
<i>Flush in mL</i>	<i>10</i>	<i>10</i>	<i>10</i>
<i>Waste in mL</i>	<i>5</i>	<i>10</i>	<i>10</i>

b)

<b>Pediatrics</b>	<b>Maintenance IV</b>	<b>TPN &amp; lipids</b>	<b>Coag Studies</b>
<i>Flush in mL</i>	<i>10</i>	<i>10</i>	<i>10</i>
<i>Waste in mL</i>	<i>5</i>	<i>10</i>	<i>10</i>

If it is not possible to get the blood specimen off the TPN line, do a venipuncture from the opposite side from which the infusion is occurring. In these cases it should not be necessary to stop the TPN infusion and a waste tube would not be necessary.

If the venipuncture needs to be drawn off the same side as the TPN infusion, staff needs to follow the same process as if drawing were done where there was an IV.

#### **SAFETY PRECAUTIONS:**

Safety devices are always used.

Needles are not recapped, or clipped.

Contaminated waste is disposed into biohazard containers.

Follow procedures and precautions described in the Saint Michael's Hospital Infection Control and Hazard Communication manuals, as well as the Saint Michael's Hospital Chemical Hygiene Plan. Refer to the MSDS for reagent-specific handling guidelines.

#### **ATTACHMENTS:**

1-SUPERFICIAL VEINS OF UPPER ARM

2-HAND, FOOT, AND ANKLE VIEWS

3-Vacutainers Used By Saint Michael's Hospital Laboratory

4-Minimum Volumes for Pediatric Patients

5-Minimum Volumes for Specific Tests

**REFERENCES:**

Procedures for the Collection of Diagnostic Blood Specimens by Venipuncture, Second Edition, NCCLS Vol. 18, No. 7.

PHLEBOTOMY HANDBOOK Blood collection essentials Fifth Edition, Diana Garza & Kathleen Becan-McBride 1999

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Changed Procedure Note #1 from Phlebotomists do not draw off of ports or indwelling catheters to only phlebotomists specially trained in line draws may draw off of ports and indwelling lines.

Deleted "When performing the venipuncture, draw off a 5 ml discard tube before drawing the required tubes." From procedure note 4.0

**APPROVAL:**

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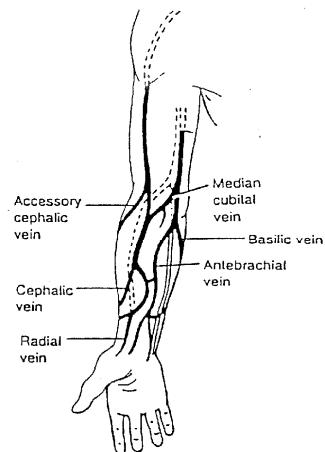
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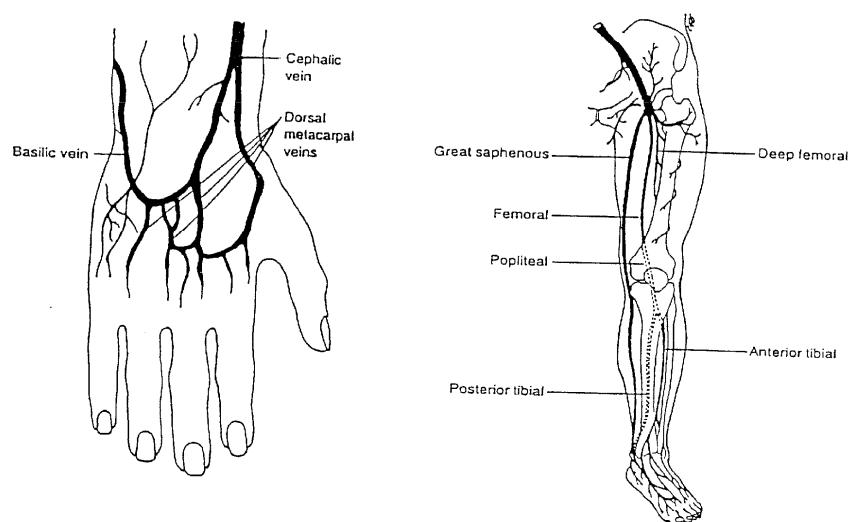
H:\Lab\LabManuals\Phlebotomy\CurrentPhlebotomy Policies\PH-001.04 Venipuncture  
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### SUPERFICIAL VEINS OF THE UPPER LIMB



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### HAND, FOOT AND ANKLE VEINS



Laboratory Services

**Minimum Volumes For Specific Tests**

Test	Minimum Volume (microtainer)	Minimum Volume (Vacutainer)
CBC	Lavender, 250 mcL (half full)	Lavender, 1 mL
MPB	Green, 0.5 mL	PST, 0.5 mL
MPC	TWO Greens, each 0.5 mL	PST, 1.0 mL
TSH	Green, 0.5 mL	PST, 0.5 mL
Free T4	Green, 0.5 mL	PST, 0.5 mL
TSH & Free T4	Green, 0.5 mL	PST, 0.5 mL
CRP	Green, 0.5 mL	PST, 0.5 mL
Glucose	Green, 250 mcl (half full)	n/a
Lead	Lavender, 250 mcl (half full)	n/a
Iron/TIBC	TWO Greens, each 0.5 mL	PST, 1.0 mL
ESR	n/a	1 mL whole blood
Cholesterol	Green, 250 mcl (half full)	n/a
Lipid Profile	Green, 0.5 mL	PST, 0.5 mL
Electrolytes	Green, 0.5 mL	PST, 0.5 mL
Mono	Lavender, 250 mcl (half full)	n/a



Saint Michael's Hospital  
MINISTRY HEALTH CARE

Laboratory Services  
Minimum Volumes For Pediatric Patients

Test	Minimum Volume (microtainer)	Minimum Volume (Vacutainer)
CBC	Lavender, 250 mcL (half full)	Lavender, 1 mL
MPB	Green, 0.5 mL	PST, 0.5 mL
MPC	TWO Greens, each 0.5 mL	PST, 1.0 mL
TSH	Green, 0.5 mL	PST, 0.5 mL
Free T4	Green, 0.5 mL	PST, 0.5 mL
TSH & Free T4	Green, 0.5 mL	PST, 0.5 mL
CRP	Green, 0.5 mL	PST, 0.5 mL
Glucose	Green, 250 mcl (half full)	n/a
Lead	Lavender, 250 mcl (half full)	n/a
Iron/TIBC	TWO Serum/Amber, each 0.5mL	RTT/SST, 1.0 mL
ESR	n/a	Lavender, 1 mL whole blood
Cholesterol	Green, 250 mcl (half full)	n/a
Lipid Profile	Green, 0.5 mL	PST, 0.5 mL
Electrolytes	Green, 0.5 mL	PST, 0.5 mL
Mono	Lavender, 250 mcl (half full)	n/a

VACUTAINER TUBES USED BY SAINT MICHAEL'S HOSPITAL Effective 1/1/09

Description	Stopper	Additive	Size	Draw	# in case	Stock #	Vendor
K2EDTA 7.2mg	Lav Hemoguard	EDTA 7.2mg	13 X 75	4.0 ml	1000/cs	367861	BD
3.2% Na Citrate	Blue Plastic	3.2% Na Citrate	13 X 75	2.7 ml	1000/cs	363083	BD
Plain-plastic	Red	none	13 X 75	4.0 ml	1000/cs	367812	BD
Plain-plastic	Red	none	13 x 100	7.0 ml	1000/cs	366431	BD
Plain-plastic	Red	none	16 x 125	10 ml	1000/cs	366432	BD
Serum SST	Yellow-Hemoguard	none	13 X 100	5.0 ml	1000/cs	367986	BD
Lithium Heparin PST	Grn Hemoguard	56 usp of lithium heparin	13 X 75	4.0 ml	1000/cs	454008	Greiner
Lithium Heparin (Drugs)	Green (glass)	68 usp units lithium heparin	13 X 75	5.0 ml	1000/cs	366485	BD
NaFl/K oxylate 10 mg	Grey/Hemoguard	NaFl/K oxylate 10 mg/8mg	13 X 75	4.0 ml	1 pkg	367922	BD
Plain	Red	none	10.3 X 64	3.0 ml	1 pkg	366381	BD
Plain - Tr Elements	Navy Blue/Hem	none	13 X100	6 ml	100	368300	MMC
EDTA Heavy Metals	Royal Blue	10.5 mg EDTA (Na2)	13 X100	7.0 ml	each	3007022	MMC
Sodium Heparin	Green/Hemog	68 usp units	13 X75	4.0 ml	100	367871	MMC
ACD- A	Yellow	Solution A	15 X100	10.0 ml	each	364606	MMC
ACD- B	Yellow	Solution B	13 X100	7.0 ml	each	364816	MMC
EDTA Na MetabiSO4	Lavender	Na MetabiSO4	13 X100	10.0 ml	each	'atecholamine	MMC